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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



the application of : Confirmation No. 7009
Jean-Marie AUBRY et al. : Docket No. 2001_1443A
Serial No. 09/937,724 : Group Art Unit 1621
Filed September 28, 2001 : Examiner E. Price

SINGLET OXYGEN OXIDATION
OF ORGANIC SUBSTRATES

REPLY TO ADVISORY ACTION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is in reply to the Advisory Action dated October 8, 2003.

REMARKS

A Request for Continued Examination (RCE) was filed on October 8, 2003.

Concurrently therewith, the Advisory Action dated October 8, 2003 was issued to which Applicants respond below.

The Advisory Action states that the catalyst used by Barton is ammonium molybdate, which is basic in nature, and therefore Applicants' argument that Van Laar teaches the presence of alkaline conditions and Barton uses the catalyst in the absence of water and a base is not convincing.

This contention is untenable because firstly, Van Laar teaches that homogeneous catalysts, in particular molybdate and calcium, which is also basic in nature (first column, page 267), need a soluble base and further, Van Laar teaches that, in general, homogeneous molybdate systems require a base (column 2, page 268).

This fact was common knowledge to those skilled in the art and has been taught in the literature, e.g. Aubry in *J. Org. Chem.* 54, 726-728 (1989), which discloses at column 1, page 726 that molybdate ions catalyze disproportionate amounts of hydrogen peroxide in a basic solution. In the Experimental section, it can be seen that Aubry uses sodium molybdate, again a catalyst with a basic nature, in combination with sodium hydroxide and sodium hydrogen carbonate.

From this it can be seen that it was state of the art, at the time that the present invention was made, to use molybdate catalysts with an additional base, as taught by Van Laar as well as by Aubry.

Further, the Advisory Action states that Barton discloses that a mixture of two products, the hydroxy-dienone and quinone are formed by the singlet oxidation of benzamide V (column 1, page 1612).

In column 1 on page 1612, Barton discloses that treatment of the benzamide V with singlet oxygen, which is generated by light, (hv, eosin-O₂) gave, after reduction with Me₂S, a mixture of two products, from which the hydroxy-dienone IX is the major product as well as a small amount of quinone VI.

This is in keeping with the teaching of Barton, page 614, column 2, where there is explicit disclosure of singlet oxygenation of the benzamide V, which produces the hydroxy-dienone IX that contains only some quinone VI.

Therefore, the quinone VI is only a trivial by-product or even a mere impurity.

Further, the prior art fails to disclose or suggest the catalyst recycle feature of the present claims.

Accordingly, the rejection on prior art is untenable.

No further issues remaining, allowance of this application is respectfully requested.

If the Examiner has any comments or proposals for expediting prosecution, please contact undersigned at the telephone number below.

Respectfully submitted,

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